

## PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 09 MAY 2005

WIPO PCT

Applicant's or agent's file reference MTC025BWO	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/EP2004/000233	International filing date (day/month/year) 15.01.2004	Priority date (day/month/year) 17.02.2003
International Patent Classification (IPC) or national classification and IPC B01J8/00		
Applicant METHANOL CASALE S.A.		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> <i>(sent to the applicant and to the International Bureau) a total of sheets, as follows:</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> <p>b. <input type="checkbox"/> <i>(sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</i></p>
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<p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the opinion</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul>
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Date of submission of the demand 03.09.2004	Date of completion of this report 03.05.2005
Name and mailing address of the international preliminary examining authority: European Patent Office - Gitschner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840	Authorized Officer Gruber, M Telephone No. +49 30 25901-336



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/000233

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

**Description, Pages**

1-11 as originally filed

**Claims, Numbers**

1-4 as originally filed

**Drawings, Sheets**

1/3-3/3 as originally filed

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/000233

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-4
	No: Claims	
Inventive step (IS)	Yes: Claims	1-4
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-4
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.  
**PCT/EP2004/000233**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following document:

D1: EP-A-0 094 208 (BABCOCK & WILCOX CO) 16 November 1983 (1983-11-16)

✓

- 1 The application is considered to meet the requirements of Article 33 PCT because the subject matter of claims 1 to 4 is new and inventive.
- 1.1 Document D1 which is considered to represent the closest prior art discloses (ref. fig. 1 and page 2, lines 7 to 16 and page 4, lines 1 to 16) a method for regulating the temperature in a reactor that is filled with a catalyst and that comprises a heat exchanger by regulating the flow rate of the coolant (i.e. the speed of heat exchange fluid) through the heat exchanger.

The subject matter of claim 1 **differs** from the disclosure of D1 in that a specific relation between the heat exchange coefficient of the coolant and the heat exchange coefficient of the catalyst bed is given. D1 keeps silent in this respect.

The heat exchange coefficient depends on the temperature gradient of a given material in an anti reciprocal way. The applicant discovered that, by suitably reducing the heat exchange coefficient inside the heat exchangers, the reactant/product mixture that crosses the catalytic bed benefits from greater uniformity of temperature (lower temperature gradient) which in turn allows to obtain a greater efficiency of reaction and thus greater global conversion yield.

Claims 2 and 3 are dependent on claim 1 and also comply with the requirements of Art. 33(1) PCT.

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.  
PCT/EP2004/000233

**1.2** The subject matter of claim 4 differs from the disclosure of D1 in that the temperature within the catalyst bed is measured by means of a probe at a first position in the middle between the two (or more) heat exchangers and a second position adjacent to a heat exchanger.

The use of probes at the described positions provides information about a temperature profile within the catalyst bed taking into account temperature differences between places which are remote from and adjacent to the heat exchange tubes. This allows - by varying the flow rate of the heat exchange fluid - a more precise control of the reaction conditions within the catalyst bed which is necessary for monitoring the temperature profile in the bed and determining the heat exchange coefficient according to the method of claim 1.